

ZOOLOGY.—*Typhlops lumbricalis* and related forms. DORIS M. COCHRAN, National Museum. (Communicated by Dr. L. STEJNEGER).

In 1920 K. P. Schmidt discussed<sup>1</sup> the status of the Porto Rican blind-snake, assigning to it the name *Typhlops richardii* Duméril and Bibron. He compared it with the Cuban form and found constant differences in scalation.

The collection of the so-called *Typhlops lumbricalis* in the National Museum had never been studied critically, and as this collection contains specimens from Guadeloupe, St. Thomas, Abaco, and Jamaica, localities which Schmidt did not include in his study for lack of specimens, a thorough examination of this material has seemed advisable.

The scale-counts of the six Porto Rican specimens in the National Museum bear out Schmidt's observations very well. He found that there were 22 scale-rows around the anterior portion of the body in the fourteen specimens at his disposal, and he counted 365 to 415 scales from the head to the tip of the tail. In my Porto Rican specimens I find the same number of scales around the body, while the minimum and maximum numbers in the longitudinal count are about 370 and 420. The four specimens from Jamaica in the National Museum have also 22 scale-rows around the body anteriorly, with a minimum and maximum count from head to tail of about 405 to 425 scales. Five specimens from St. Thomas, likewise with 22 scale-rows, have from 335 to 365 scales counted the length of the body.

It may be noted that the blind-snakes from these three islands—St. Thomas, Porto Rico, and Jamaica—have the same number of scale-rows around the body, while the number of scales counted from head to tail forms a graded series, the lowest count—335 to 365—coming from the easternmost island, St. Thomas, while Porto Rico, close by in a westerly direction, has from 365 to 420, and Jamaica, further still to the west, has a minimum count of not less than 405 and a maximum of 425.

The Cuban specimens examined by Dr. Schmidt had 20 scales around the anterior part of the body; on my larger series of 19 specimens I find the same number. From head to tail he counted 270 to 325 scales; on my series there are 255 to 340 scales. The three specimens from Santo Domingo in the National Museum have about 270 to 305, and 20 rows around the body, agreeing with the Cuban form in these respects. The single specimen from Abaco Island, one of the Bahama islands, mentioned by Cope<sup>2</sup>

<sup>1</sup> Ann. N. Y. Acad. Sci. 23: 195. 1920.

<sup>2</sup> Proc. U. S. Nat. Mus. 10: 439. 1887.

has a similar scale-formula—20 scale-rows, 260 scales the length of the body, 11 under the tail—and undoubtedly belongs to the same group.

An increase in the number of scales from head to tail, accompanying the westerly distribution, is to be noted likewise in this group of blind-snakes characterized by the possession of 20 scale-rows around the body. Those from Santo Domingo have no more than 270; those from the eastern end of Cuba have between 255 and 285; while from the western end (Havana and Pinar del Rio Provinces) there are between 270 and 320. Whether a large series of specimens will bear out these observations is a question to be settled by future collectors.

The single recorded specimen from Navassa Island, the type of Cope's *Typhlops sulcatus*,<sup>3</sup> has 20 scale-rows anteriorly around the body, and about 395 scales from head to tail. The suture extending from the nostril to the lateral edge of the rostral plate, which is present in snakes from all the other islands, is lacking in this specimen in spite of Cope's statement to the contrary. It is better to regard *Typhlops sulcatus* as a valid species until more material is received and the status of this form can be satisfactorily settled.

In regard to Dr. Stejneger's establishment<sup>4</sup> of the validity of *Typhlops dominicana* from the island of Dominica, a species characterized by the possession of 24 scale-rows and a very wide rostral, it is interesting to note that our five specimens sent by L. Guesde from Guadeloupe are undoubted examples of *T. dominicana*. The rows around the body are 24 in number, the scales from head to tail range between 400 and 440 in this series, and the rostral is noticeably very wide in every specimen.

The blind-snake found in Porto Rico and Jamaica must be called *Typhlops jamaicensis* (Shaw). The description of *Anguis jamaicensis* by Shaw<sup>5</sup> is based exclusively on the accounts of Browne and Seba. Shaw himself suspected that his "Jamaica slow-worm" was not the same as the Linnaean species, as he definitely questions the reference to *Anguis lumbricalis*. The comparison of the Jamaican species with the Cuban species having the low scale-count proves that his suspicion was well-founded.

In the use of the name *Typhlops lumbricalis* for the Jamaican blind-snakes Schmidt follows the example of Dumeril and Bibron, who considered that the Linnaean name of *T. lumbricalis* was based upon the Jamaican *Amphisbaena subargentea* of Browne. The facts, however, are as follows:

In the tenth edition of *Systema Naturae*<sup>6</sup> the characterization of *lumbricalis* is "230-7." The first reference given by Linnaeus under the name *lumbricalis* is the *Museum ichthyologium* of Gronovius, Tom. II, 1758, p. 52, no. 3, followed by a reference to Browne's *History of Jamaica* and to Seba's *Thesaurus*. The description by Gronovius of a specimen in his own col-

<sup>3</sup> Proc. Acad. Nat. Sci. Philadelphia 1868: 128.

<sup>4</sup> Rep. U. S. Nat. Mus. 1902: 637. 1904.

<sup>5</sup> Gen. Zool. 3<sup>d</sup>: 558.

<sup>6</sup> 1: 258. 1758.

lection is a very complete and satisfactory one, considering the time at which it was made. It begins with the polysyllabic name, "Anguis squamis abdominalibus cexxx, et squamis caudalibus vii." This specimen with the small number of scales is therefore the one upon which Linnaeus bases his species *Anguis lumbricalis*, hence this name is applicable only to the blind-snakes with a small scale-count—those from Cuba, Santo Domingo and the Bahamas; consequently *T. richardii* must take its place as a synonym of *jamaicensis*. Linnaeus took the reference to Browne's and Seba's works directly from Gronovius, but this quotation, of course, does not affect the fact that the specific name is based on a specimen with 237 scales from head to tip of tail. Even the name *lumbricalis* was suggested to him by Gronovius' comparison of this specimen with *Lumbricus terrestris*, the common earth-worm.

Duméril and Bibron described<sup>7</sup> a *Typhlops* collected by Plée and alleged to have come from Martinique. This species, *T. platycephalus*, having 20 longitudinal rows, 350 transverse rows on the body and 12 on the tail, was separated by them from *T. richardii*, having 20 longitudinal rows, 300 to 350 transverse rows, and about 15 on the tail, chiefly because their specimen of *T. platycephalus* had parietals much larger than the scales surrounding the ocular, which was not the case with their examples of *richardii*. In my six Porto Rican snakes I find that this relation is extremely variable, as the parietal in two of the specimens is distinguishable from the surrounding scales by its position alone, while in two others the parietal is about twice as large as the other scales bordering the eye posteriorly and superiorly. In the Cuban specimens I find the same great variability in the size of the parietal. With regard to the type-locality of *platycephalus*, Dr. Stejneger in the *Herpetology of Porto Rico* has shown<sup>8</sup> that the majority of Plée's specimens attributed to Martinique actually came from Porto Rico. As the number of rows around the body in Duméril and Bibron's specimen is given as 20, the count may have been made at the middle of the body, in which case the true maximum would not have been discovered. The number of scales from head to tip of tail, 350 plus 12, is within the limits of *jamaicensis*. The probability is that the type of *Typhlops platycephalus* came from Porto Rico; consequently it may be regarded as a synonym of *jamaicensis*. As Dr. Stejneger has shown<sup>9</sup> in his *Herpetology of Porto Rico* Boulenger's description<sup>10</sup> of what he supposed to be *Typhlops platycephalus* was taken from specimens in the British Museum at that time, which were all from Dominica, and which are now recognized under the name of *Typhlops dominicana* Stejneger.

<sup>7</sup> Erp. Gén. 6: 293.

<sup>8</sup> Rep. U. S. Nat. Mus. 1902: 557. 1904.

<sup>9</sup> Rep. U. S. Nat. Mus. 1902: 687. 1904.

<sup>10</sup> Cat. Snakes Brit. Mus. 1: 30.

The specimens of *lumbricalis* from Cuba, as well as all of the *T. jamaicensis*, have two postoculars between the parietal and the upper labials. In this respect they differ from the single Navassan and two Santo Domingan specimens, which have but one postocular. The third specimen has two small postoculars on one side of the head. The parietal scale in the Santo Domingan specimens is relatively larger than in either of the two Porto Rican specimens having large parietals. A large series of blind-snakes is needed to determine whether the single postocular and the extremely large parietal are characters sufficiently constant to warrant specific distinction for the Santo Domingan form.

The synonymy of the species is therefore as follows:

TYPHLOPS LUMBRICALIS (Linnaeus)

1758. *Anguis lumbricalis* Linnaeus, Syst. Nat. 10th ed., 1: 288 (type-locality, America).  
 1830. *Typhlops cubae* Bibron, in Sagra's Hist. Fis. Pol. Nat., 4: Rept., p. 122, pl. 22 (French ed. p. 204) (type locality, Cuba).

TYPHLOPS JAMAICENSIS (Shaw)

1802. *Anguis jamaicensis* Shaw, Gen. Zool. 3: 588 (type locality Jamaica).  
 1844. *Typhlops richardii* Duméril and Bibron, Erp. Gén. 6: 290 (type locality St. Thomas).  
 1844. *Typhlops platycephalus* Duméril and Bibron, Erp. Gén. 6: 293 (type locality, Martinique, Porto Rico).  
 1904. *Typhlops lumbricalis* Stejneger, Rep. U. S. Nat. Mus. 1902: 684. 1904. (Porto Rico.)

TYPHLOPS SULCATUS Cope

1868. *Typhlops sulcatus* Cope, Proc. Acad. Nat. Sci. Philadelphia 1868: 128 (type locality Navassa Island).

TYPHLOPS DOMINICANA Stejneger

1830. *Typhlops cinereus* Guérin, Icon. Règne Anim., Rept., pl. 18, f. 2 (Guadeloupe) (not of Schneider, 1801).  
 1893. *Typhlops platycephalus* Boulenger, Cat. Snakes Brit. Mus. 1: 30 (Dominica) (not of Duméril and Bibron, 1844).  
 1904. *Typhlops dominicana* Stejneger, Rep. U. S. Nat. Mus. 1902: 687. 1904.

ZOOLOGY.—*On the value of nuclear characters in the classification of marine gastropods.*<sup>1</sup> WILLIAM H. DALL, National Museum.

The so-called nucleus in marine gastropods consists of the protoconch, the succeeding larval or nepionic coils, and sometimes a transitional part prefiguring the adult sculpture.

The primal protoconch in *Gastropoda* is a smooth cup gradually increased by growth into the summit of a spiral. It may be small or

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